JAN 2 4 2002 E

SEQUENCE LISTING

10> DeBonte, A Frank R Fan, Zhegong Miao, Guo-Hua

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<140> US 09/771,904

<141> 2001 (01-29)

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<221> misc feature

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Glu Thr Asp Thr Ile Lys Arg Val Pro Cys Glu Thr Pro Pro Phe Thr

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25

30

gtc gga gaa ctc aag aaa gca atc cca ccg cac tgt ttc aaa cgc tcg
Val Gly Glu Leu Lys Lys Ala Ile Pro Pro His Cys Phe Lys Arg Ser

35
40
45

atc cct cgc tct ttc tcc tac ctc atc tgg gac atc\atc ata gcc tcc 192
Ile Pro Arg Ser Phe Ser Tyr Leu Ile Trp Asp Ile Ile Ile Ala Ser
50 55 60

tgc ttc tac tac ntc gcc acc act tac ttc cct ctc ctc cct cac cct

Cys Phe Tyr Tyr Xaa Ala Thr Thr Tyr Phe Pro Leu Leu Pro His Pro

65					70					75			80	
				_								tgc Cys 95		288
												gcc Ala		336
												cac His		384
			-						_			agc Ser		432
								_	_			ccc Pro		480
-	-		_		_				_			cct Pro 175		528
												ccg Pro		576
												ttc Phe		624
_							Pro					cgt Arg		672
												ggt Gly		720
												ttc Phe 255		768
	-	_		_		_						act Thr		816
												gag Glu		864

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Asp Trp Phe 290	agg gga Arg Gly	Ala I										912
ttg aac aag Leu Asn Lys 305												960
ccg ttc tcc Pro Phe Ser		_				-	-	-				1008
ata aag ccg Ile Lys Pro												1056
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tga												1155
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His Ser Asn Thr Gly Ser Leu Glu Arg Asp Glu Val Phe Val Pro Lys
                    150
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Lys Lys Ser Asp Ile Lys Trp Tyr Gly Lys Tyr Leu Asn Asn Pro Leu
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Gly Arg Thr Val Met Leu Thr Val Gln Phe Thr Leu Gly Trp Pro Leu
                                185
Tyr Leu Ala Phe Asn Val Ser Gly Arg Pro Tyr Asp Gly Gly Phe Arg
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Cys His Phe His Pro Asn Ala Pro Ile Tyr Asn Asp Arg Glu Arg Leu
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                                            220
Gln Ile Tyr Ile Ser Asp Ala Gly Ile Leu Ala Val Cys Tyr Gly Leu
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Phe Arg Tyr Ala Ala Gly Gln Gly Val Ala Ser Met Val Cys Phe Tyr
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                                    250
Gly Val Pro Leu Leu Ile Val Asn Gly Phe Leu Val Leu Ile Thr Tyr
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Leu Gln His Thr His Pro Ser Leu Pro His Tyr Asp Ser Ser Glu Trp
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Asp Trp Phe Arg Gly Ala Leu Ala Thr Val Asp Arg Asp Tyr Gly Ile
                        295
Leu Asn Lys Val Phe His Asn Ile Thr Asp Thr His Val Ala His His
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                    310
Pro Phe Ser Thr Met Pro His Tyr His Ala Met Glu Ala Thr Lys Ala
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                                    330
Ile Lys Pro Ile Leu Gly Glu Tyr Tyr Gln Phe Asp Gly Thr Pro Val
                                345
Val Lys Ala Met Trp Arg Glu Ala Lys Glu Cys Ile Tyr Val Glu Pro
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gaa acc gac acc atc aag cgc gta ccc tgc gag aca ccg ccc ttc act
                                                                       96
Glu Thr Asp Thr Ile Lys Arg Val Pro Cys Glu Thr Pro Pro Phe Thr
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	Leu Lys Lys Al		cac tgt ttc aaa His Cys Phe Lys 45		144
		Leu Ile Trp	gac atc atc ata Asp Ile Ile Ile 60	-	192
			cct ctc ctc cct Pro Leu Leu Pro 75		240
			gcc tgc caa ggg Ala Cys Gln Gly	, ,	288
			tgc ggc cac cac Cys Gly His His 110	Ala Phe	336
	Gln Trp Leu As		ggt ctc atc ttc Gly Leu Ile Phe 125		384
		e Ser Trp Lys	tac agt cat cgc Tyr Ser His Arg 140	-	432
			gaa gtg ttt gtc Glu Val Phe Val 155	•	480
			tac ctc aac aac Tyr Leu Asn Asn	-	528
			act ctc ggc tgg Thr Leu Gly Trp 190	Pro Leu	576
	Phe Asn Val Se		tac gac ggc ggc Tyr Asp Gly Gly 205	-	624
		a Pro Ile Tyr	aac gac cgc gag Asn Asp Arg Glu 220	-	672
_			gcc gtc tgc tac Ala Val Cys Tyr 235	3 3	720

•

				tc tgc ttc tac al Cys Phe Tyr 255	768
Gly Val Pro				tg atc act tac eu Ile Thr Tyr 270	816
			His Tyr Asp S	cg tcc gag tgg er Ser Glu Trp 85	864
				ac tac gga atc sp Tyr Gly Ile	912
				tg gcc cat cat al Ala His His 320	960
				ct acc aag gcg la Thr Lys Ala 335	1008
Ile Lys Pro				gg acg ccg gtg ly Thr Pro Val 350	1056
			Glu Cys Ile T	at gtg gaa ccg 'yr Val Glu Pro 65	1104
				ac aat aag tta sn Asn Lys Leu	1152
tga					1155
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Val Gly Glu 3	20 Leu Lys Lys	25 Ala Ile Pro 40	Pro His Cys E	30 Phe Lys Arg Ser 45	

Ile Pro Arg Ser Phe Ser Tyr Leu Ile Trp Asp Ile Ile Ala Ser 55 Cys Phe Tyr Tyr Xaa Ala Thr Thr Tyr Phe Pro Leu Leu Pro His Pro 75 70 Leu Ser Tyr Phe Ala Trp Pro Leu Tyr Trp Ala Cys Gln Gly Cys Val Leu Thr Gly Val Trp Val Ile Ala His Lys Cys Gly His His Ala Phe 105 Ser Asp Tyr Gln Trp Leu Asp Asp Thr Val Gly Leu Ile Phe His Ser 125 115 120 Phe Leu Leu Val Pro Tyr Phe Ser Trp Lys Tyr Ser His Arg Ser His 135 His Ser Asn Thr Gly Ser Leu Glu Arg Asp Glu Val Phe Val Pro Lys 150 155 Lys Lys Ser Asp Ile Lys Trp Tyr Gly Lys Tyr Leu Asn Asn Pro Leu 165 170 Gly Arg Thr Val Met Leu Thr Val Gln Phe Thr Leu Gly Trp Pro Leu 185 Tyr Leu Ala Phe Asn Val Ser Gly Arg Pro Tyr Asp Gly Gly Phe Arg 195 200 Cys His Phe His Pro Asn Ala Pro Ile Tyr Asn Asp Arg Glu Arg Leu 215 Gln Ile Tyr Ile Ser Asp Ala Gly Ile Leu Ala Val Cys Tyr Gly Leu 230 235 Phe Arg Tyr Ala Ala Gly Gln Gly Val Ala Ser Met Val Cys Phe Tyr 250 245 Gly Val Pro Leu Leu Ile Val Asn Gly Phe Leu Val Leu Ile Thr Tyr 265 Leu Gln His Thr His Pro Ser Leu Pro His Tyr Asp Ser Ser Glu Trp 275 280 Asp Trp Phe Arg Gly Ala Leu Ala Thr Val Asp Arg Asp Tyr Gly Ile 295 Leu Asn Lys Val Phe His Asn Ile Thr Asp Thr His Val Ala His His 310 315 Pro Phe Ser Thr Met Pro His Tyr His Ala Met Glu Ala Thr Lys Ala 330 325 Ile Lys Pro Ile Leu Gly Glu Tyr Tyr Gln Phe Asp Gly Thr Pro Val 345 340 Val Lys Ala Met Trp Arg Glu Ala Lys Glu Cys Ile Tyr Val Glu Pro 360 Asp Arg Gln Gly Glu Lys Lys Gly Val Phe Trp Tyr Asn Asn Lys Leu 370 375

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_		gaa Glu 35		_		-			_		-			144
		cgc Arg												192
_		tac Tyr		_	-									240
		tac Tyr												288
		ggc Gly	-		-		-			-				336
		tac Tyr 115												384
		ctc Leu	_						-					432
		aac Asn						_	-					480
		tca Ser												528
	_	acc Thr												576
		gcc Ala 195			_	_		_						624

tgc cat ttc cac Cys His Phe His 210		Pro Ile Tyr		672
cag ata tac atc Gln Ile Tyr Ile 225				720
tac cgc tac gct Tyr Arg Tyr Ala				768
gga gtt ccg ctt Gly Val Pro Leu 260	Leu Ile Val		e Thr Tyr	816
ttg cag cac acg Leu Gln His Thr 275				864
gat tgg ttg agg Asp Trp Leu Arg 290				912
ttg aac aag gtc Leu Asn Lys Val 305				960
ctg ttc tcg acc Leu Phe Ser Thr				1008
ata aag ccg ata Ile Lys Pro Ile 340	Leu Gly Glu		r Pro Val	1056
gtt aag gcg atg Val Lys Ala Met 355				1104
gac agg caa ggt Asp Arg Gln Gly 370		Gly Val Phe		1152
tga				1155
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<212> DNA

<213> Brassica napus

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	tta Leu														624
_	cat His 210					_					-	_		_	672
_	ata Ile				-	-									720
	cgc Arg		-	-	-			_	_	_	_	-	-		768
	gtt Val	_		-							-	-			816
	cag Gln		_				_				-	_		-	 864
	tgg Trp 290														912
-	aac Asn	-	-					_	-	-					960
_	ttc Phe	_		_	_					_	_				1008
	aag Lys														1056
	aag Lys														1104
	agg Arg 370														1152
tga													•		1155
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gaa acc gac aac atc aag cgc gta ccc tgc gag aca ccg ccc ttc act
Glu Thr Asp Asn Ile Lys Arg Val Pro Cys Glu Thr Pro Pro Phe Thr
                                  25
gtc gga gaa ctc aag aaa gca atc cca ccg cac tgt ttc aaa cgc tcg
                                                                      144
Val Gly Glu Leu Lys Lys Ala Ile Pro Pro His Cys Phe Lys Arg Ser
                             40
                                                                      192
atc cct cqc tct ttc tcc tac ctc atc tgg gac atc atc ata gcc tcc
Ile Pro Arg Ser Phe Ser Tyr Leu Ile Trp Asp Ile Ile Ile Ala Ser
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                         55
                                                                      240
tgc ttc tac tac gtc gcc acc act tac ttc cct ctc cct cac cct
Cys Phe Tyr Tyr Val Ala Thr Thr Tyr Phe Pro Leu Leu Pro His Pro
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65
                                          75
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Leu Ser Tyr Phe Ala Trp Pro Leu Tyr Trp Ala Cys Gln Gly Cys Val
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cta acc qqc qtc tqq qtc ata qcc cac qaq tqc qqc cac cac gcc ttc
                                                                      336
Leu Thr Gly Val Trp Val Ile Ala His Glu Cys Gly His His Ala Phe
            100
                                 105
                                                     110
age gae tae cag tgg etg gae gae ace gte gge ete ate tte cae tee
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Ser Asp Tyr Gln Trp Leu Asp Asp Thr Val Gly Leu Ile Phe His Ser
        115
                            120
                                                                      432
tto etc etc gte ect tac tte tec tgg aag tac agt cat ega ege cac
Phe Leu Leu Val Pro Tyr Phe Ser Trp Lys Tyr Ser His Arg Arg His
                        135
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                                                                      480
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His Ser Asn Thr Gly Ser Leu Glu Arg Asp Glu Val Phe Val Pro Lys
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                                         155
145
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Lys Lys Ser Asp Ile Lys Trp Tyr Gly Lys Tyr Leu Asn Asn Pro Leu
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					gtc Val							624
					aac Asn							672
					gac Asp 230							720
					gtc Val							768
	-			_	att Ile	_						816
_	_		_		cct Pro							864
					gct Ala							912
					cac His 310							960
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tga												1155

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Ile Pro Arg Ser Phe Ser Tyr Leu Ile Trp Asp Ile Ile Ile Ala Ser
                         55
Cys Phe Tyr Tyr Val Ala Thr Thr Tyr Phe Pro Leu Leu Pro His Pro
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                                         75
Leu Ser Tyr Phe Ala Trp Pro Leu Tyr Trp Ala Cys Gln Gly Cys Val
                                    90
                85
Leu Thr Gly Val Trp Val Ile Ala His Glu Cys Gly His His Ala Phe
            100
                                105
Ser Asp Tyr Gln Trp Leu Asp Asp Thr Val Gly Leu Ile Phe His Ser
                           120
Phe Leu Leu Val Pro Tyr Phe Ser Trp Lys Tyr Ser His Arg Arg His
                        135
                                            140
His Ser Asn Thr Gly Ser Leu Glu Arg Asp Glu Val Phe Val Pro Lys
                                        155
                    150
Lys Lys Ser Asp Ile Lys Trp Tyr Gly Lys Tyr Leu Asn Asn Pro Leu
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                                    170
Gly Arg Thr Val Met Leu Thr Val Gln Phe Thr Leu Gly Trp Pro Leu
           180
                                185
Tyr Leu Ala Phe Asn Val Ser Gly Arg Pro Tyr Asp Gly Gly Phe Ala
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Cys His Phe His Pro Asn Ala Pro Ile Tyr Asn Asp Arg Glu Arg Leu
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Gln Ile Tyr Ile Ser Asp Ala Gly Ile Leu Ala Val Cys Tyr Gly Leu
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Leu Gln His Thr His Pro Ser Leu Pro His Tyr Asp Ser Ser Glu Trp
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Asp Trp Leu Arg Gly Ala Leu Ala Thr Val Asp Arg Asp Tyr Gly Ile
                        295
                                            300
Leu Asn Lys Val Phe His Asn Ile Thr Asp Thr His Val Ala His His
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Leu Phe Ser Thr Met Pro His Tyr His Ala Met Glu Ala Thr Lys Ala
                325
                                    330
Ile Lys Pro Ile Leu Gly Glu Tyr Tyr Gln Phe Asp Gly Thr Pro Val
                                345
Val Lys Ala Met Trp Arg Glu Ala Lys Glu Cys Ile Tyr Val Glu Pro
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